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Protean¹ Communication: The Language of Computer-Mediated Communication

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Computer-mediated communication (CMC), which began in proprietary companies two decades ago, has developed into a worldwide medium of communication that ESOL learners encounter inside and outside the classroom. Because learners' participation in CMC is likely to increase in the coming years, it is important for TESOL professionals to understand the norms of language use developed by CMC-based speech communities. Research has found that CMC exhibits features of simplified registers associated with both oral and written language. It also exhibits its own norms for organizing conversation and accommodating threads of discourse. CMC, however, cannot be studied as a neutral linguistic phenomenon; instead, researchers and educators need to examine how CMC influences the dominance of English, access to knowledge and power, and equity in discourse. Distance learning, an application of CMC that has begun and will continue to serve a role in English language teaching and in ESOL teacher education, is an area in which these issues are relevant. CMC should be viewed not in terms of its functionality but in terms of the ways in which users shape a new medium of communication to fit the needs of their speech community.

In trying to predict changes in higher education as a result of technology, a report for The College Board (Gladieux & Swail, 1999) notes, "The fact is, computer and related technologies are evolving so quickly—and new providers and brokers of higher education proliferating so rapidly—no one knows" its future (p. 8). Yet computer-mediated communication (CMC) appears to be a salient mode of communication among the educated middle class, especially in English-dominant countries, and is being promoted as a tool to facilitate (English) language learning or ESOL teacher education (e.g., Nunan, 1999; Sperling, 1996; Warschauer, 1995). As CMC becomes part of English language teaching (ELT) and ESOL teacher education, TESOL professionals need to

¹ Proteus, a sea god who served Neptune, had the power to assume different shapes.

understand and critically examine its structure and use. However, a critical examination of CMC and its implications for the future is problematic: Its history covers a mere two decades. In this short period, CMC researchers have primarily used case study methodology; few researchers have studied the language of CMC, especially as it relates to (English) language learning; very little research has been conducted in non-English-dominant countries or among language minority communities; and any descriptions of the technologies and functions of CMC are likely to be outdated by the time they are published.

Despite these difficulties, prior work examining CMC speech communities offers a starting point for critical analysis. This article begins by clarifying what is meant by the term *CMC* and then describes findings about the linguistic characteristics of various types of CMC to demonstrate their protean nature. Following this description is a critical analysis of CMC in view of the dominance of English, differential access to technology, and control of CMC discourse. CMC in distance education is then discussed in light of this critical analysis and its historical context.

WHAT IS CMC?

The term CMC was coined by Hiltz and Turoff (1978) in their classic study of computer conferencing, their use of the term being confined to this mode of electronic communication. Other researchers include communication via e-mail, bulletin boards, Internet Relay Chat (IRC), e-mail discussion lists, chat rooms, and the World Wide Web (e.g., Herring, 1996a; Hiltz & Wellman, 1997; Jones, 1998). Warschauer (1999), on the other hand, restricted the term to modes in which people send messages to individuals or groups. D. E. Murray (1986, p. 19) identified an interactivity continuum within CMC, from computer messages (a form of instant messaging [IM]) as the most interactive to billboards as the least. In 1997, the on-line *CMC Magazine* focused an entire issue on the question "What is CMC?", leading to a spirited debate, with P. Murray (1997) claiming (accurately) that "it means different things to different people, which is both its strength and the source of some of the problems arising in the research literature" (n.p.). Howard (1997), however, rejected the term CMC in favor of *networked texts* because he considered this technology a new medium rather than a repackaging of orality and literacy and because he focused his study on "the power to shape and maintain the communities that shape and maintain us" (p. 2).

For the purposes of this article, I use the more usual term CMC and restrict Herring's (1996a) open-ended definition ("communication that

takes place between human beings via the instrumentality of computers,” p. 1) by modifying communication to include only text-based modes. This definition still covers a wide range of functions. Although it deliberately excludes uses of computer technology that do not involve communication, such as pop-up toasters or computer games, it is sufficiently flexible to cover evolving technologies whose study will add to the current knowledge about human discourse (e.g., two-way text messaging on wireless telephones). It does not, however, include spoken language modes, such as the use of computers for telephony or future voice-to-voice technologies that will involve text recognition and speech synthesis. This definition also allows for the binary division of CMC into synchronous and asynchronous modes. In synchronous modes of CMC, communication occurs in real time; examples are IRC and MOOs (MUDs [multiuser dungeons or dimensions], object oriented), both of which require participants to be communicating in the same session. Asynchronous modes of CMC, such as e-mail and bulletin boards, do not require participants to be on-line at the same time. However, because of the time delays of the medium, even real-time communications are asynchronous, the length of the delays depending on variables such as the computer, network, and typing speed.

CMC SPEECH COMMUNITIES

Linguists have posited the construct of *speech community* as an organizing principle for clusters of shared linguistic and nonlinguistic features of human interaction. Although competing definitions of speech community have merit, “it is possible that speech communities do not really exist in society except as prototypes in the minds of people, in which case the search for the ‘true’ definition of ‘speech community’ is just a wild goose chase” (Hudson, 1980, p. 30). Nonetheless, the term speech community has been useful in describing the challenge of the nonnative speaker of English who must learn the particular linguistic conventions of a group (Swales, 1990). The large majority of ESOL learners may need to access CMC speech communities, so the construct serves as an organizing concept for examining CMC. A speech community is a group of people who share norms of linguistic and nonlinguistic interaction but whose norms may be evolving or may be sites of struggle. The language of CMC exhibits certain characteristics, and speech communities have incorporated this new medium into their repertoire of language use in particular ways.

Linguistic Characteristics

Examination of four linguistic characteristics reveals the nature of CMC: (a) its similarity to spoken or written language, (b) its use of simplified registers, (c) its organizational structure, and (d) its mechanisms for maintaining topic cohesion.

Spoken or Written Language?

Early observers of CMC were quick to note the orality of this literacy event (e.g., D. E. Murray, 1988a; Ong, 1982). However, based on ethnographic data, in previous work (D. E. Murray, 1988a) I argued that in CMC the complex interaction of contextual aspects results in specific bundles of linguistic features, the medium being only one aspect of the context. Using a Hallidayan (e.g., 1978) approach to context, I showed how CMC users moved from telephone, to e-mail, to face-to-face communication, for example, because of differences in the topic, the power relations between the interlocutors, or the setting. As a CMC conversation moved into personnel issues, one of the participants might ask to move to the telephone, which is more secure but amplifies different features of communication than CMC does; for example, features such as stress and intonation are available on the telephone but not in CMC. Or participants moved from the synchronous mode of IM to the asynchronous mode of e-mail because the latter provides a permanent record of the conversation and permits multiple threads of discourse (see below). Subordinates e-mailing to management wrote more formally (and in a more literate manner) than they did to peers.

Using Biber's (1988) multidimensional-multifeature model for analyzing language variation, Collot and Belmore (1996) found features of both oral and written language in their bulletin board system corpus. Yates (1996) conducted a large corpus-based comparison among spoken, written, and CMC discourse; the CMC data came from open computer conferences using the CoSy system at Open University in the United Kingdom. The spoken corpora were from the London-Lund corpus, and the written, from the Lancaster-Oslo/Bergen corpus. Using the Hallidayan model of language use, Yates' analysis also identified some textual features of CMC (e.g., lexical density) that were similar to those most often found in writing and others (e.g., use of first person) most often found in oral language.

Using a variety of analytical tools, Gains (1999) examined 116 randomly selected e-mail messages from the United Kingdom, 62 exchanged within a large insurance company and 54 exchanged within and between universities. He found standard written business English in the

insurance company data but conversational features in the academic data. The insurance company e-mailers, for example, used a semiformal style, did not incorporate features from conversational discourse, tended not to include an opening greeting, and used few features of a simplified register. The academic e-mailers, on the other hand, used a range of styles, adopted features from conversational discourse (e.g., *well, you see*), included some form of greeting, and referred often to the medium itself.

From their analysis of the linguistic features of 1,353 messages sent and received between 1981 and 1984 by the developers of the Common Lisp programming language, Yates and Orlikowski (1993) identified speechlike characteristics (e.g., informality), written characteristics (e.g., textual formatting), and features particular to the electronic medium (e.g., graphic humor). Like D. E. Murray (1991), they demonstrated that “the context of interaction . . . influences the particular combination of linguistic and textual characteristics” (p. 16).

Despite all this linguistic evidence, writers outside the field of linguistics (e.g., Shank & Cunningham, 1996; Snyder, 1998) continue to focus on the speech-in-writing characteristic of some uses of CMC. If one takes the social rather than the technology as prior, one finds that people use linguistic modes and features appropriate to their particular context. “As with both written and spoken discourse, CMC is affected by the numerous social structural and social situational factors which surround and define the communication taking place” (Yates, 1996, p. 46).

Simplified Register

Simplified registers result from particular features of the context; either the speaker perceives the addressee to be a language user with limited competence or is performing under constraints on time or space. The former is exemplified by caretaker talk (e.g., Ferguson, 1977), foreigner talk (e.g., Ellis, 1985), and teacher talk (e.g., Gaies, 1977; Henzl, 1974), used by adults to babies, native speakers to nonnative speakers, and teachers to students, respectively. These registers are characterized by reduced or simplified speech; slow, exaggerated pronunciation and intonation; short sentences; special lexicons; and feedback devices that facilitate the listener’s or reader’s comprehension. The latter situation is exemplified by newspaper headlines (e.g., Straumann, 1935), advertising (e.g., Leech, 1966), or note-taking (Janda, 1985). In this type of register, simplification may include the use of abbreviations and the omission of articles, pronouns, and copula. Here, the goal is not to facilitate comprehension but to provide efficient communication given limits on time or space.

In CMC, the addressee is perceived as competent, but the technology

constrains time and space. Most nonlinguistic discussions of CMC demonstrate that it may take place anywhere, anytime; however, CMC relies on typing, computer, and network speed. Additionally, CMC gives no visual paralinguistic or nonverbal cues. Consequently, CMC users employ strategies that reduce the time needed to write the message or substitute for the lack of paralinguistic and nonverbal cues (see, e.g., Ferrara, Brunner, & Whittemore, 1991; Gains, 1999; D. E. Murray, 1991). These strategies include

- the use of abbreviations—both standard back formations, such as *info* and *tech*, and acronyms, such as *IMHO* for *in my humble opinion* or *F2F* for *face-to-face*
- simplified syntax, such as subject or modal deletion
- the acceptance of surface errors, such as typographical and spelling errors
- the use of symbols to express emotional meaning, such as multiple vowels or consonants (*yeeess*) or emoticons (faces typed with keyboard characters; e.g., :) for a happy face)
- formulaic phrases, such as programmed *emotes* (phrases used to display actions or emotions in a chat room; e.g., *looks around the room carefully*, used to check whether everyone who wants to speak has done so)

In earlier work (D. E. Murray, 1988a) I noted that simplified register features were more common in IM (what I called *e-messages*) than in e-mail and that the features were used less in e-mail when one or more aspects of the context prompted greater formality (e.g., when the addressee was a manager). Gains (1999) also noted a difference between his two data sets. The insurance company employees wrote e-mail that resembled formal business letters; the academics used a more conversational style. Yet both used abbreviations, perhaps because each group formed a speech community with its own specialized discourse.

Structure of CMC Conversations

Speech communities have developed norms—such as openings, closings, greetings, turn taking, and adjacency pairs—for the structuring and regulation of conversations that use different media of communication. In telephone conversations, for example, both speaker and hearer often identify themselves; in face-to-face conversation, self-identification is not necessary except with strangers. Openings and closings are optional in CMC, mostly because the technology automatically identifies the sender and recipient. Gains (1999) found that the insurance company workers did not use greetings whereas the academics did. I also found that the

CMC users in a business environment did not use greetings, especially in IM (D. E. Murray, 1991). However, all groups frequently used closings. Because of time delays, turn taking in both synchronous and asynchronous modes includes more overlaps than face-to-face or telephone conversation does (Davis & Brewer, 1997; D. E. Murray, 1988b; Werry, 1996). When two people talk at the same time face-to-face, one person cedes the floor to the other. Because this is not possible in CMC, the receiver decides among competing turns, choosing which ones to answer in which order. In e-mail, this choice is invisible to the sender; in IM and IRC, the turn taking is transparent.

Using speech-act theory, I hypothesized a model of CMC for business environments called *conversation for action* (D. E. Murray, 1991), the main elements of which are the initial action bid or request and the responding action, which may be followed by an assertion that the requested action has been completed. Business CMC contains "a high proportion of requests, which may indicate that this is a popular form for asking people to do something without the necessity of the elaborate rituals of social pleasantries" (Gains, 1999, p. 98); hence the limited use of greetings, openings, and even closings.

Topic Thread Cohesion

E-mail is often used as a vehicle for multiple threads of discourse (Black, Levin, Mehan, & Quinn, 1983) because it is easily retrievable as permanent text; synchronous modes, such as IM, on the other hand, are better suited to single topics. However, precisely because of its asynchrony, e-mail even on a single topic can be sent over large time spans and arrive interwoven with e-mail on different topics. Because recipients find it difficult to track the topic and to retrieve and store relevant e-mail messages for later access, some researchers (e.g., Lewis & Knowles, 1997) have proposed tools that would track these multiple threads. Consequently, many rules of *netiquette*² specify that e-mail users should restrict each message to a single topic (see, e.g., Shea, 1994).

E-mail respondents also use a variety of strategies to signal the continuation of a topic. Explicit reference to the topic in a previous message (e.g., *In your last e-mail you asked for . . .*) is similar to the use of referents, such as *You know when we were talking about X last week, well . . .* used in oral conversation. However, these explicit references are often ambiguous, as in the example just given, which assumes the recipient will

² To reduce *flaming* (free emotional responses), the coordinators of e-mail discussion lists wrote in-house rules for contributors to follow. These rules became known as *netiquette* (coined from *net* and *etiquette*). Today, the term is in common use, and books of *netiquette* have been written.

remember the content of the last e-mail message to that person. Repeating the topic in the subject line or using the automatic reply function (without appending the e-mail) is similar to writing *Your Ref: Letter dated . . .* in business letters.

A distinctive characteristic of e-mail is the appending of all previous e-mail messages on the same topic, creating an electronic thread of continuity that provides conversational context. In some ways the function of appending in e-mail is similar to that of literature reviews in academic writing, in which all the possible background information (or hyperlinks) is made explicit. However, appending previous, related e-mail messages merely requires using the *reply and append* function rather than the *reply with no append* function; the e-mailer does not summarize, analyze, or synthesize the previous messages. On the other hand, an effective literature review is among the most difficult uses of language, requiring skill and care in selecting, analyzing, and synthesizing previous studies. A loosely compiled list of summaries of previous research (still more difficult to create than an e-mail message with relevant messages appended) is considered an inadequate literature review.

The research data on the linguistic characteristics of CMC are limited and therefore present many opportunities for further descriptive work. Despite the findings described above, research seems to demonstrate the protean nature of communication as specific speech communities develop their own norms for the orderly conduct of communication. Many questions remain, however, about the characteristics of particular types of CMC to which ESOL learners need to gain access.

CMC as Part of Speech Communities' Repertoire

Much discussion of computer-based technology speaks to its inevitability, making its consequences, such as CMC, a foregone conclusion rather than a tool under the control of human intention or accountability. In 1980, Kay, in testimony before the U.S. Congress, claimed that the computer will "literally change the fabric of society" and that "the genie is out of the bottle as far as worrying about controlling it is concerned, it is uncontrolled right now; it is just going to happen" (*Hearings*, 1982). More recently, in a widely popular book about the future of the digital world, Negraponte (1995) claimed that e-mail would be the dominant medium for interpersonal communication in the 21st century. Neither CMC research nor an analysis of the introduction of other technologies of communication supports this view.

The findings of research on the uses of CMC, as opposed to its characteristics, indicate that the various types of CMC (from IM to

MOOs) become part of the entire repertoire of language modes available to language users (see, e.g., Baron, 1998; D. E. Murray, 1998a). They then decide, based on the context, which modality to use for a particular speech event. For example, an individual can choose to thank a colleague via e-mail, by telephone, face-to-face, or in a handwritten note. This choice is the result of the complex interaction among the various aspects of the context, such as topic, audience characteristics, and setting (D. E. Murray, 1998a). Both time and space (physical distance) greatly affect which modes can be chosen. CMC is not bound by time and space as face-to-face conversation is, but the various modes of CMC differ in this regard: IM can only be used synchronously; e-mail, though predominantly asynchronous, can appear almost synchronous.

Time and space are not the only aspects of the context that determine the choice of mode. As CMC users become more familiar with asynchronous modes, they realize the ease with which they can forward e-mail and conclude that no e-mail message is actually private or confidential. IM users, realizing the evanescence of the mode, take more risks through behavior that is less socially sanctioned (e.g., flaming, telling crude jokes).

In addition to choosing the mode for a speech event, users also choose when to shift from one mode to another. Subjects in a previous study (D. E. Murray, 1988a) moved from e-mail to face-to-face for more privacy, for example. Furthermore, the social conventions for mode choice are still being negotiated. Baron (1998) observes, "Nowhere is this issue clearer than in deciding what message to attend to when signals arrive from more than one modality" (p. 161). Which takes precedence—e-mail, telephone, or face-to-face conversation? Rules of netiquette often ask users not to check e-mail while engaged in face-to-face conversation. That this guideline needs to be stated is evidence that conventions for precedence of modality are as yet unresolved.

Similarly, in a comparison of the introduction of earlier literacy technologies with the introduction of information technologies (D. E. Murray, *in press-a*), I show that new technologies did not replace earlier ones. The introduction of writing did not replace oral communication; the advent of print did not replace writing; the telephone did not replace handwritten letters; electronic communication has not replaced print. Rather, communities rearrange their web of communication, with some functions changing to the new technology and others staying with the older technology. The role of each mode is contested socioculturally, with different communities making different choices.

Bell and Gray (1997) of Microsoft Corporation asserted that "by 2047 . . . all information about physical objects, including humans, buildings, processes and organizations, will be on-line. This is both desirable and inevitable" (p. 5). If computer technology and an on-line presence are

inevitable, then educators, the argument goes, must include computer literacy in the school curriculum. For if educators fail to include technology in students' educational experience, they engage in "a kind of educational malpractice" (Green, 1997, p. 9). This rhetoric of inevitability, which disempowers by assuming that users of the technology are not in control of the new ways of communicating, needs to be met by a critical examination of CMC.

CRITICAL ISSUES IN CMC USE

No technology is neutral or value free. Historical evidence demonstrates that technology use carries social meaning; social values and practices develop around the use of a new technology. Different technologies amplify certain features of communication and reduce others (Bowers, 1998). For example, the telephone amplifies the voice while reducing nonverbal and paraverbal cues such as gesture and intonation. Consequently, the telephone became not just a machine but a way of communicating, with socially constructed conventions for opening and closing conversations that vary across speech communities. With the advent of the telephone answering machine and subsequently of voice mail, speech communities developed new conventions, such as voice mail messages that contain multiple conversational moves—identification of the person reached, an apology for absence, and a request to leave a message. None of these conventions was part of the design of the machine; they were socially constructed and contested over time.

Similarly, "there are many earlier points [than the World Wide Web] in the development of computers that dramatically revealed the precedence of communication over computation" (Winograd, 1997, p. 150). Winograd cites two such examples: the use of the Internet for communication rather than for its originally intended purpose, remote computing; and the use of the personal computer for communication via tools, such as word-processing, presentation, and e-mail software. Even before the development of the personal computer, people turned a "computing" machine (hence the name computer) into a medium of communication. Early mainframe machines were designed to perform calculations (especially for the war effort during World War II) faster and more accurately than humans could. Yet, within a very short time, users had adopted computers for communication. The first messages sent were usually one-line requests from programmers working at dumb terminals to operators, asking them to mount a tape, fix a printer jam, or perform another task. Very quickly, people logged onto the same mainframe computer at the same time realized they could also send such one-liners to communicate; hence the introduction of *e-messages*, which later

became IM and chat rooms (see D. E. Murray, 1986, for a full description of e-messages). Next, developers created the store-and-forward capability so that users could send data files to people not logged on. Again, users took advantage of this feature to send not just data but communications, that is, e-mail. More recently, as Winograd mentions, the Internet, which grew out of the U.S. Department of Defense's Advanced Research Project Agency network (ARPANET), has become a major vehicle for communication, although it was designed for remote computing among universities and other agencies engaged in research for the Department of Defense.

Like all media of communication, the computer amplifies some characteristics of communication and reduces others. Because the conventions for interaction via CMC are still being contested, the rhetoric that poses computer-based communication as unproblematic and inevitable must change and instead consider it as socially constructed. This shift in rhetoric involves taking the stance of *critical literacy* or *critical pedagogy* (e.g., Shor, 1996; Wallerstein, 1983; Wink, 1997), that is, of examining how the language and its use frame interaction. Critical approaches examine the various ways that power operates in society. Critical literacy in particular examines the ways "discourse may play crucial roles in perpetuating the ways difference is understood, reproduced, or changed" (Pennycook, 1999, p. 332). Just as critical studies of other discourses have unveiled inequalities, so, too, will critical studies of CMC. In particular, examination of three critical questions should help shape how English language educators use CMC in classes and professional life: (a) Whose language dominates the discourse? (b) Who has access to the technology? (c) Who controls the discourse? (See D. E. Murray, 1999, in press-b, for a more detailed discussion of these issues.)

The Dominance of English

Research revealing the hegemony of English, especially one or two prestigious varieties (e.g., Canagarajah, 1999; Crystal, 1997; Kachru & Nelson, 1996; Pennycook, 1995), has so far failed to consider the language of cyberspace, where English dominates as it does in international business, entertainment, research, and other areas of communication (see the argument below). The domination of cyberspace by English is the result not only of the global expansion of English as a lingua franca but also of the historical development of the technology itself. The early developers of computational machines were English speakers (e.g., Charles Babbage, the inventor of the analytical engine, and Alan Turing, the inventor of the universal machine, were both English). Commercial development and subsequent advances in the technology occurred

mostly in the United States (see Augarten, 1984, for a history of computers). The Internet, as noted, was an outgrowth of ARPANET, the network developed by the U.S. Department of Defense (see Hafner & Lyon, 1996, for a history of the Internet). The World Wide Web grew out of a notion first suggested by Bush (1945), director of the U.S. Office of Scientific Research and Development during World War II. It is therefore not surprising that, in 1997, 60% of the world's Internet host computers were located in the United States (Network Wizards, 1997).

The most comprehensive statistics on CMC use in various languages are available only for the accessing of Web pages or for Internet use, not for uses of CMC such as e-mail. These statistics show that 83.0% of Web pages were in English in 1997 (Babel, 1997). The next most common language for Web pages was German, at 4.0%, followed by Japanese, at 1.6%. The percentage of Web pages in Spanish and Chinese, the other two languages with large numbers of speakers worldwide, was exceptionally small: only 1.1% and fewer than 0.1%, respectively. A more recent survey (Computer Economics, 1999) presents raw data indicating that 128 million English speakers and 88 million non-English speakers use the Internet; however, the language of the user is not necessarily the language of Internet access. In addition, the non-English-speaking market for the Internet is growing faster than the English-speaking market. Although no statistical data exist on the languages used in e-mail, the data on Web pages, the data on Internet host computers, and the data presented below in the section Differential Access to the Technology show that computer technology itself is available primarily in English-dominant countries.

English norms may dominate even in CMC speech communities in which nonnative speakers of English participate, such as e-mail and chat groups. Participants who are not competent in English may be excluded from a potentially influential medium of communication or, worse still, may experience the use of English as a tool of power. Baird (1998), for example, describes how Native American Chat (a chat room) strengthens Indian (her preferred term) identification and allows the formation of networks never possible before. This speech community has developed its own norms for interaction, including the "policing" of people who claim to be Indian but are not. Yet the language of the chat room is English, with some code switching into the native language (e.g., Cherokee). Recently a startup company has developed a search engine for East Africa with the catchy headline "Think Globally, Search Locally" (Turner, 1999). Yet the language of the search engine is English. Warschauer (1999) describes how one ESL student, Atsuko, "was harassed by a self-appointed guardian of 'correct' English after she dared venture on an international e-mail list" (p. 171). More recently, in their study of the use of English and Arabic on-line in Egypt, Warschauer,

Zohry, and Refaat (2000) found that Egyptian Colloquial Arabic was used for Internet chat (for which they used a romanized Arabic) whereas English was used for Web pages and formal CMC.

When speakers of languages other than English try to use their mother tongue on-line, they are hampered by a technology that was designed for English. The character system (ASCII—American Standard Code for Information Interchange) used for written language in cyberspace privileges the Roman alphabet, making it extraordinarily difficult to represent other writing scripts without special software. Warschauer et al. (2000) note that most computers lack Arabic operating systems. Even languages that use the Roman alphabet with diacritics are difficult to represent, especially in CMC; either many of the diacritics are stripped in transfer, or the browser does not allow diacritics to be typed.

The conventions of CMC speech communities and the technical facts of Internet use leave English language educators with a paradox. On the one hand, teaching English provides learners with the opportunity to participate in the global speech community of CMC; on the other hand, English teachers may be helping ensure that local languages will not find voice on the Internet.

Differential Access to the Technology

“Virtual space is infinite, but it does not promise universality or equity” (Gladieux & Swail, 1999, p. 22). Although many people are denied access to CMC speech communities because they speak languages other than English, many others are denied access because they do not have the required computer technology. Access to and use of computers and the Internet mirror the socioeconomic divide between rich and poor individuals and nations. In the United States, race, gender, education, and income are all predictors of computer access and use. Fifty percent of U.S. homes have computers, and 33% are on-line; however, these are the homes of educated, affluent, Whites in which males are the primary users of the Internet (Claymon, 1999; Novak & Hoffman, 1998; Plotnikoff, 1999). In education, despite U.S. President Bill Clinton’s goal of connecting every classroom to the Internet by 2000, only 78% of U.S. schools are reported to be connected; this figure includes connections in the library, media center, and principal’s office (National Center for Education Statistics, 1998). Even this figure is misleading, for actual hands-on access for students is still quite limited: Only 43% of schools have such access in five or more instructional rooms. Moreover, the schools with such access are suburban, White, and middle class; only 63% of schools with high percentages of minority or poor students report Internet access. In U.S. colleges, freshmen at private universities were most likely

to have access to e-mail (80.1%); students at public, historically Black colleges had the least access (41.4%) ("E-Mail and the American Freshman," 1999).

Although these data refer to Internet access in general, it seems safe to infer that differences in access to CMC are at least equally dramatic, as highlighted by a story recently reported in U.S. newspapers (Cassidy, 2000). Myra, a Navajo middle school student, surfed the Web at school (with her teacher's encouragement), entered an on-line competition, and won a new computer from a startup company in Silicon Valley. The young girl was delighted; the chief executive officer of the company was astonished to find that Myra's home did not have a telephone line with which to connect her new computer to the Internet. Furthermore, the estimated cost of installing such a line was U.S.\$23,000–\$35,000 because the family lived so far from the nearest telecommunications line. And even if the company paid for the line, Myra's family could not afford the monthly telephone bill.

Across nations, the same chasm exists. Per capita Internet use is high among the affluent postindustrial nations. In 1997, Finland, at 244.5 per 1,000, had the highest per capita use; the worldwide average was 16.9 per 1,000 ("Top 15 Countries for Net Usage," 1998). Per capita use in Japan was 63.1 per 1,000, largely because of the cost of telephone lines rather than a lack of computers (Chandler, 1999). Indeed, it is because of lack of infrastructure such as telephone lines and inexpensive power and paper that Africa remains the least computerized continent.

The data on access are collected and presented in so many different ways that comparisons are difficult. For some countries, reports are in raw numbers; for others, reports are the percentage of population. Some report number of households with a personal computer; others report use (e.g., number of Internet uses per week). Some data are available for 1998, others for the beginning of 1999, and still others for the end of 1999. Compounding the difficulty of comparison is the recency with which the Internet became available; in Saudi Arabia, for example, Internet connection began only in 1999. Despite the difficulties of comparison, Tables 1 and 2, compiled by *Computer Industry Almanac* and *CyberAtlas* from several different data sets, give some indication of the distribution of Internet use.

In nations with burgeoning information technology (e.g., India), access is often restricted by infrastructure problems and tied to individual wealth. Although individual Indian states such as Andhra Pradesh have offered incentives to attract investment, International Data Corporation's late 1999 survey of technology readiness in 55 countries (as reported in Heim, 2000) ranked India second to last, largely because of lack of reliable telecommunications services: India has 2.4 phones per 100 people, China has 10.0, and the United States has more than 101.0.

TABLE 1
Internet Users in 1998, by Region

Region	Internet users per 1,000 people
Worldwide	30.65
North America	311.20
Western Europe and Scandinavia	105.80
Eastern Europe	13.01
South and Central America	11.37
Asia-Pacific	9.93
Middle East and Africa	3.03

Source: "North America Is the Leading Region for Internet Users" (1999).

In Gujarat, India, for example, Dalit (lower caste) or OBC (Other Backward Classes) students need access to computers both to develop their English skills through interaction and to qualify for the many jobs that require computer literacy (Ramanathan, 1999), but they do not have such access. Indeed, learners with the least access to fluent English speakers in their community are also unlikely to have access to CMC as a source of authentic language experiences.

The statistics revealing who has access to the Internet contrast sharply with predictions implied by the euphoria of scholars who expected that computer technology would be a tool for equity and social justice. Proponents of the idea that social justice could be propagated through the Internet predicted that the barriers erected by class, gender, and race

TABLE 2
Internet Users in Late 1999, by Region

Region	Internet users (%)
United States	43.0
United Kingdom	27.0
Canada	25.0
Australia	25.0
Korea	22.4
Italy	15.0
Hong Kong	14.0
Malaysia	7.0
China	4.0
Czech Republic	< 3.0
Indonesia	1.0

Source: "The Big Picture: Demographics" (2000).

would be broken down through CMC because it masks physical cues of those characteristics. In reality, however, these same characteristics appear to remain barriers to physical access to CMC.

Control of the Discourse of CMC

Access can also be viewed from a local perspective of interaction, the question being whether control of the discourse of CMC is evenly distributed among participants. The limited research on these issues provides no simple answer. Early research on CMC behavior (e.g., Sproull & Kiesler, 1986) drew attention to the phenomenon of flaming, which was attributed to the lack of physical cues and social norms in CMC. Other researchers (e.g., Davis & Brewer, 1997; Ferrara et al., 1991; D. E. Murray, 1991) have not found evidence of these emotional outbursts, attributing the different findings to differences in the speech communities studied. However, Herring, who has conducted a variety of studies on gender and CMC, including linguistic analyses (1996c) of 136 individual messages from two Internet mailing lists (*LINGUIST* and *WMST* [the Women's Studies List]), an electronic survey on network etiquette (1993), an ethnographic observation of nine CMC lists (1996b), and a content analysis of netiquette statements on e-mail lists (1996b), has shown that a *male discourse style*—characterized by debate, freedom from rules, and adversarial argumentation—currently dominates the Internet. Men also complain more than women do about messages that they perceive as containing little information (Herring, 1996b). Herring identifies the female style as one of politeness and consideration, alignment, support, and appreciation. However, women's messages are "more informative, in contrast with male messages which most often express (critical) views" (Herring, 1996c, p. 82). Additionally, those in the minority gender of the particular list shift their styles toward the majority style.

Allen (1995), on the other hand, found in a case study of e-mail use among employees in the corporate headquarters of a U.S. public broadcasting service (a nonprofit corporation providing television programming) that women had more positive attitudes toward e-mail use than men did. Her data included interviews with 30 employees randomly selected but representing five hierarchical levels. These interviews were followed by a survey (with 192 responses) eliciting attitudes toward e-mail use, patterns of use, and demographic data. The women in Allen's study rated e-mail more highly than men did in terms of ease of use, usefulness, efficiency, and effectiveness. She speculates that these findings may be the result of women's greater ease with word processing and their supportive and nurturing attitude toward communication. In a

recent summary of studies on gender differences in CMC, Herring (2000) notes "a tendency for Internet users to display features of culturally learned gender styles in their typed messages" (p. 6).

Thus, the research so far contradicts the predictions of many commentators that CMC would create a more equal site for communication. The assumption was that CMC would allow for anonymous interaction in which gender was masked. However, the research shows that users of asynchronous CMC mostly retain their real-life identities, and even when they try to mask their gender, gender-specific cues are visible through discourse style. Synchronous CMC shows more equal participation, at least in terms of number of messages and message length; however, participants often either ask others to reveal their gender or display their own through their language use (Herring, 2000).

In a meta-analysis of experimental studies published between 1980 and 1990, McLeod (1992) found that synchronous electronic support systems, such as e-mail and electronic conference rooms, facilitate decision making by groups: Group members focus more on the task, participate more equally, make higher quality decisions, strongly support their decisions, and believe them to be correct; however, they take longer to reach decisions and are less satisfied with the results. However, English language educators should be aware that switching to electronic communication will not necessarily lead to a student-centered, egalitarian learning environment. Some instructors (Hawisher & Selfe, 1998) found that they dominated electronic classroom discussions as much as they did face-to-face discussions. Thus, it would seem that norms of behavior of a speech community can prevail despite the medium. Further research is needed to substantiate this claim. In short, CMC requires the same critical lens that is used to uncover pedagogical practices and question the status quo of interaction in any ELT or TESOL teacher education classroom, just as Nunan (1999) has attempted to do in his preliminary study on delivering TESOL graduate courses via distance education on the Web.

DISTANCE EDUCATION: A PEDAGOGICAL APPLICATION OF CMC

One growing application of CMC in education has been its incorporation into distance education programs. A quick search on-line indicates that a number of traditional universities and consortia of such universities offer teacher education courses and degrees in TESOL through distance education. Similarly, a number of schools around the world offer ELT on-line, either as part of a more traditional curriculum or as a stand-alone language program. The TESOL association began offering

professional development on-line in 1998. The technology used in such programs includes (streaming) video, multimedia conferencing, and the entire range of CMC modes. The use of CMC in teacher education and ELT needs to be examined in terms of the larger context of distance education in order to discover whose interests are served.

Historical Context of Distance Education

Although the particular characteristics of distance education delivered through CMC appear to be qualitatively different from those of prior educational delivery mechanisms, distance education itself is not a recent phenomenon. This traditional stepchild of most educational systems has simply gained popular attention in the past two decades. Many current practices have their roots in correspondence courses, in which students and teachers exchanged lectures and assignments via the postal service. These courses began around the turn of the 20th century in several countries to meet differing local needs, but the democratizing voice for social justice through distance education is evident in these early efforts. In the United States, a number of colleges, such as the People's College in Kansas, were instituted to "bring education within the reach of every man, woman, and child, and . . . teach the viewpoint of the working class" (Greer, 1999, p. 252). In Australia, individual state departments of education began to operate correspondence schools in the 1920s with the goal of reaching children in remote areas of the country, where 95% of the population lives in coastal urban areas.

In some states, these programs later incorporated technology as it was developed for other purposes, at first voice, using the pedal wireless system (radio powered by pedal-driven generators) originally designed for the Flying Doctor Service.³ These programs were called School of the Air. In the 1960s, television (either live or taped) was used for distance education programs in the United States, and in the 1980s, satellites were harnessed. Probably the most recognized distance-learning program is the United Kingdom's Open University, which was founded in 1969 and has served 2 million students worldwide through a combination of correspondence, television, face-to-face tutorials, and, more recently, computer-based technologies. Now many countries, universities, and schools are developing *virtual campuses* (supplements to regular instructional modes) or even *virtual universities*, which deliver all instruction remotely via technology.

³ The Royal Flying Doctor Service, established in Australia in 1928, had become nationwide by the 1930s, providing not only emergency medical care for people in the outback but also comprehensive health care and community service. Today the service covers an area larger than Western Europe and operates around the clock from 19 bases.

Distance Learning for Whom?

The impetus for the proliferation of distance-learning courses, programs, and degrees, of which ELT and TESOL are only one part, comes from several sectors—industry, educational institutions, students, and the public. As computer networks, software, and other hardware have developed, industry has looked for new markets; educational institutions, with rising student enrollments and shrinking budgets, have seen distance learning as a cost-effective delivery system; with the development of higher levels of knowledge and skills for high-paying jobs, students have recognized the need for higher levels of education; and the public has shown an increased desire to reduce the cost of education, especially at the college level. Students and educators focus on computer-based distance education's anywhere, anytime (both in real time and not in real time)—and, I would add, anything—functionality and therefore its ability to reach nontraditional students.

Demographic research on distance learning in general shows that students who take distance-learning courses are mostly female, married, working full-time, and 25–50 years old (Moore & Kearsley, 1996), a group that is a major focus of Open University. However, this profile is becoming equally that of the traditional student, for, at least in the United States, “the traditional age cohort (18–22 years of age), living on campus and attending classes full time, represents today only 25 percent of total enrollment” (Van Dusen, 1998, p. 60). In an interview (Irving, 1999), Sir John Daniel, vice chancellor of Open University, noted, “We’re trying to provide a convenient form of education. Anything we require the student to do at a particular time and place we have to be really convinced that adds value” (n.p.). Many educators claim that classrooms requiring face-to-face interaction indeed provide added value—a community of learners. As noted earlier, published demographic data on computer and Internet use indicate that on-line college courses and degrees provide expanded educational opportunities for students with easy access to computers but are less useful for poor and minority students who do not have that access (Gladieux & Swail, 1999).

The Value of Distance Learning?

Although virtual distance learning is proliferating, there is little research in any field that critically examines either the effectiveness of instruction or the nature of human communication via CMC. Two recent reports on distance education using new technologies in higher education in the United States (Institute for Higher Education Policy, 1999, 2000) remark on the promise and the peril of virtual universities.

According to the second report, which reviews research on distance learning in higher education, research indicates that distance education compares favorably with traditional methods in higher education in terms of grades, test scores, and student and faculty satisfaction. However, the report writers claim that these results are questionable because the studies reviewed did not ask the research questions whose answers would tell whether distance learning is effective, including how learners engage in asynchronous CMC.

Research is needed on CMC in ELT and TESOL teacher education. Nunan's (1999) study of TESOL teacher education delivered over distance on-line provides some data but has limited findings. His study focused primarily on the interaction on-line in chat mode, which has restrictions on turn taking and the number of active participants. Nunan stressed that although such Web-based courses may facilitate collaboration and independent learning, they may equally support traditional methodologies—the technology is merely a tool.

Because much research in L2 learning (e.g., Ellis, 1999; Gass, 1997; Pica, Lincoln-Porter, Paninos, & Linnell, 1996) has indicated that student-teacher and student-student interaction facilitates language acquisition, it seems reasonable to claim that future research and discussion concerning the use of CMC in ELT distance education should “focus on the outcomes of interaction rather than the agents of the interaction” (Wagner, 1997). Although the delivery technology may present certain constraints or offer particular advantages, content and learning objectives should drive the choice of communication strategies” (Boaz, 1999, p. 41).

CONCLUSION

CMC provides a crucible for the study of how speech communities adapt language to new situations and demonstrates that the forms language takes result from the complex interaction among the various aspects of the context. Users and promoters of CMC focus on its anywhere, anytime functions but fail to critically examine who is disempowered or lacks access because of a barrier of language, culture, race, class, poverty, or gender. What lies ahead for CMC is not so much a question of its functionality but will depend on how speech communities use the variety of available communication media systematically. ELT and TESOL teacher education need to focus on communication and its speech communities rather than on the technology because “lighting a fire in the students’ heart, role modeling and nurturing may contribute more to learning than the neatest hyper-linked courseware” (Dertouzos, 1999, n.p.) or the most novel CMC tools.

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